Chapter 3: Refuge Environment

Photograph by Scott Sharkey

Introduction

All lands administered by Minnesota Valley National Wildlife Refuge are located in east central Minnesota. This portion of the State is characterized by the confluences of the Minnesota and the St. Croix rivers with the Mississippi River. The Cannon River and the Vermillion River, both smaller tributaries of the Mississippi, are also located in east central Minnesota.

These river systems lend a great deal of historic significance to this part of Minnesota. Today, it is the most populous portion of the State with more than 2.5 million citizens living within the seven-county Twin Cities metropolitan area. Its continued growth places additional development pressure on any remaining open space and natural resources. Consequently, many natural resource agencies and non-profit conservation organizations are doing what they can to save the most important natural resource sites in this area from development.

Geography, Topography, and Hydrology

Refuge River Units

The river units of the Refuge lie along a 34-mile stretch of the lower portion of the Minnesota River between historic Fort Snelling and the City of Jordan. Approximately 90 percent of the Refuge is located within the 100-year floodplain. The surrounding bluffs have slopes of 12-25 percent and at their crest average 100 feet elevation above the river valley. A natural levee along the river channel in several portions of the river has created many natural wetlands and shallow lakes in the floodplain. These wetlands are very productive and of considerable importance to waterfowl and waterbirds. A significant portion of these riverine wetlands are recharged from emerging groundwater seeps and springs along the toe of the bluff. Small feeder creeks and streams are also common in the floodplain on or near several Refuge units. Consequently, the water quality of these wetlands is high where the natural flows and recharge areas have not been altered by development.

The Minnesota River is the largest tributary of the Upper Mississippi River. From its source near Big Stone Lake in western Minnesota, the Minnesota flows southeast for 224 miles to Mankato, then northeast for 106 miles to its confluence with the Mississippi River at Fort Snelling. It transects the Minneapolis-St. Paul metropolitan area in a

northeast direction and contains lands typical of an urban to rural continuum. The river itself meanders very slowly through the valley and averages a grade of 0.8 foot per mile from Mankato to Carver. Its gradient is nearly level from Carver to its confluence with the Mississippi River.

The watershed of the Minnesota River is approximately 16,900 square miles, of which 2,000 square miles are located in South Dakota and Iowa. Most of the area was historic tallgrass prairie with high densities of prairie potholes. Since development, modern day agriculture has converted over 99 percent and 90 percent of its historic grasslands and wetlands, respectively, to cropland.

Due in part to this dramatic change in land use, the Minnesota River is subject to frequent flooding that has precluded most development within its floodplain. Although water quality seems to be improving, the Minnesota River remains the most silt-laden and polluted tributary of the Upper Mississippi River. Other sources of pollution that may affect the Minnesota River and its associated resources include leachates from landfills, storm water runoff, and untreated municipal waste. Situated in the lower portion of the Minnesota River, the Refuge and its physical, biological, cultural, and historical features are greatly affected by the river's distinct personality.

Over 50 different soils have been identified in the Refuge and most are comprised of alluvial, marsh, and peat land soil types. Hayden, Estherville, and Peaty Muck are soil series typical of upland forests, dry prairies, and marshes, respectively.

Savage Fen

The 400-acre Savage Fen complex is located within the City of Savage at the toe of the north-facing Minnesota River bluff. As suggested by its name, this area contains a fen that was created in part, by the discharge of ground waters onto the floodplain of the river. Uncommon and unique plant communities evolved under these fens conditions. The Savage Fen is comprised of very poorly drained peat and muck soils ranging from 18 inches to 3 feet in depth. These areas are typically underlain by mineral soils. Over the years, urban development has encroached upon and destroyed portions of the Savage Fen. The Refuge currently owns 200-acres of this fen while the remaining lands are either owned by MnDNR or by private landowners.

Round Lake

The 152-acre Round Lake Unit is within the City of Arden Hills in Ramsey County. It is adjacent to the now dismantled Twin Cities Army Ammunition Plant and is bounded on the west by industrial development and on the south and east by private homes. This unit lies within an area known as the Anoka Sand Plain, which was historically characterized by oak savanna and sand prairie. Its topography is highly variable and its upland soils are a dark sandy loam that support a heterogeneous mixture of grassland, trees and shrubs. Hydric soils dominate the 120-acre permanent wetland.

The deep sediments of the wetland have elevated concentrations of heavy metals including zinc, chromium, and cadmium. The origin of these contaminants was the Ammunition Plant, which during World War II allowed industrial pollutants to enter area surface waters and consequently, some of these contaminants found their way into Round Lake.

Ongoing investigations by the U.S. Army in cooperation with Service staff and several other agencies are intended to determine the threat, if any, that these contaminants have on the biological communities of this area.

Wetland Management District

The District consists of 14 counties that overlay a major portion of east central Minnesota. The northeastern portion of this District (Chisago and Washington counties) is adjacent to the St. Croix River and is characterized by rolling terrain interspersed with wetlands, lakes, and small creeks. Both of these counties are experiencing phenomenal population increases. Hennepin and Ramsey counties are where Minneapolis and St. Paul are located, respectively, and for the most part there is little opportunity to undertake habitat restoration and protection activities. Historically, however, these counties contained an array of lakes, wetlands, and streams that offered excellent fish and wildlife habitats. Any remaining wildlife habitats have been largely influenced by these cities and their infrastructure.

The central counties of the District, namely Carver, Scott, and Dakota, lie primarily within the Minnesota River watershed and contain a variety of lakes, wetlands, and remnant habitats that attest to its glaciated past. However, much of the open space and agricultural lands in these counties are rapidly being converted to suburban developments or rural residential. The western and southern counties of the District are Sibley, Nicollet, Le Sueur, Rice, Blue Earth, Waseca, and Steele. Most of these counties are rural in nature and lie within the immediate watersheds of the Minnesota River or the Cannon River. Topography in these counties is also quite variable due to their glacial history and the presence of the river systems.

A wide variety of soils occur throughout the District. In general, soil productivity increases from north to south within the District where sandy soils of northern Ramsey County transition into highly productive silt-loams of Blue Earth County. Most of the lands and easements administered by the Refuge in the District are comprised of a high percentage of hydric soils that are marginal for cropland use.

Climate

The climate in east central Minnesota is classified as a subhumid continental type characterized by significant variations between summer and winter temperatures. The region has four distinct seasons with moderate spring and fall weather. Summer is comfortable because lakes and trees serve as natural air conditioners. In contrast, Minneapolis is the second coldest city in the United States with an average daily temperature of 35 F (1.8 C). The region receives on average 34 inches of precipitation each year and most of this occurs as rainfall between May and September. Annual snowfall averages approximately 45 inches.

Natural History

Eleven thousand years ago, during the Pleistocene Epoch, an inland sea named Glacial Lake Agassiz was formed from the meltwaters of the retreating eastern edge of the Des

Moines Lobe of the Lurentide Ice Sheet. Lake Agassiz was 700 feet deep and covered over 100,000 square miles in Minnesota, North Dakota, and Manitoba. Torrential meltwater drainage from Lake Agassiz created the River Warren, which varied from 1 to 7 miles in width and from 75 to 200 feet in depth. In most of the lower river valley, the river action carved out a very wide and deep channel. As the Ice Age diminished and a northern outlet to Hudson Bay developed, the levels of both Lake Agassiz and the River Warren receded. The resulting underfit stream meandered through the extremely wide floodplain bordered by broad terraces of rock, sand, and gravel. The higher terraces have been rounded-off and dissected by later erosion. These terraces form the bluffs of what is now known as the Minnesota River Valley. Today, the Minnesota River Valley is a corridor of floodplain, forest, and wetlands that extends across some of Minnesota's most productive and intensively cultivated agricultural lands. The valley is classified as a northern floodplain forest ecosystem and flows through the Big Woods, Mississippi Sand Plains, and Southern Oak Barrens landscape regions of the State.

Archeological and Cultural Values

Archeological evidence shows that people have lived in the vicinity of the Lower Minnesota River Valley and south of the valley for almost 12,000 years. The first people, known as Paleo Indians, arrived shortly after the glaciers left the area. They are considered to have been nomadic family groups subsisting on the large mammals of that period and left behind little evidence of their occupancy. Even if these people used the valley, the catastrophic floods of the ancient glacial River Warren and accumulating siltation in the Minnesota River floodplain would have destroyed and deeply buried archeological remains. Although no Paleo Indian sites have been discovered in the vicinity, their distinctive projectile points have been found. Paleo Indian sites could be expected on the bluff tops along the Minnesota River as well as away from the river.

The people of the 5,000-year Archaic period that followed continued in the hunting-gathering tradition. However, the large mammals had died off and the evidence for these people shows larger groups with some seasonal settlement and a wider array of lithic tools exploiting a more diversified environment. Bison appear to have been an important part of their subsistence. This period includes the hot and dry altithermal (4700-3000 B.C.) when most surface water disappeared. Archaic period sites would likely be found in the trickle remnant of the Minnesota, Cannon, and other rivers, and in the bottom of formerly and subsequently large wetland basins.

Sites of the Woodland period are numerous and are found within the Refuge and the District as well as many more on other lands in the area. This period is characterized by pottery, ritual human burials, the bow-and-arrow, and semi-permanent settlements. The population increased and diversified. The people followed a diverse subsistence pattern based on a seasonal round of various habitat resource harvesting and storage, and included gardens. Some evidence for warfare exists. Sites are usually but not always associated with water, and are otherwise found in a variety of landforms including river floodplains. These woodland cultures existed until the arrival of Europeans in the middle of the 17th century.

The Minnesota River Valley has been a major route for exploration, trade, and commerce throughout its history. Pierre LeSueur first explored the Minnesota River in the 1680s

and 1690s. Likewise, the Dakota Indians used the river to transport beaver, deer, and bison hides through the fur trading era of the 1700s and 1800s. Fort Snelling was constructed in 1820 to regulate Indian trade and to guard the region from British intrusion.

Fur posts, missions, and Dakota villages were common throughout the Lower Minnesota River Valley in the 1830s. River and keel boat traffic increased which gave life to increased commerce and the promise of new lands. The signing of the treaty of Traverse Des Sioux in 1851 opened the Minnesota Territory to European settlement and over the next 20 years, paths and oxcart trails became roads and ferries were replaced by bridges. During the 1870s riverboats were replaced with railroads as seemingly endless grasslands succumbed to the mow board plow. Lands that were inhabited by Native Americans and roaming herds of bison and elk went through a very significant change in less than one generation. By the turn of the century, the Minnesota River Basin had become one of the most productive agricultural regions in North America.

In the early 1900s, a myriad of wet meadows and shallow wetlands within the Minnesota River watershed were converted into cropland. Initially, shallow ditches were constructed to drain these areas into nearby creeks and lakes. As horse-drawn plows and planters were replaced by tractors capable of handling increasingly larger machinery, deeper and wider ditches were constructed and many of the natural creeks and streams were straightened and significantly altered. Ultimately, most of this drainage ended up in the Minnesota River.

At the same time, Twin Cities residents began to use portions of the Minnesota River Valley for recreation. Country homes were constructed on its bluffs and many joined privately-owned gun clubs that offered good waterfowl hunting. As the interest in these natural resources began to grow, so did the desire to conserve the Minnesota River. The recreational significance of the valley was first formally recognized in 1934 by Governor Floyd B. Olson when he proposed a 42,000-acre park between Fort Snelling and the City of Shakopee. Likewise, Theodore Wirth proposed a similar park in 1935, as did the State of Minnesota in 1939. Unfortunately, none of these dreams materialized, in part because of the onset of World War II.

After World War II, the Cargill Corporation purchased shipyards at Savage for a grain elevator and barge loading facility for shipment of grain downstream to St. Louis and New Orleans. To facilitate this, portions of the river were straightened and a 9-foot channel was dredged between Shakopee and its confluence with the Mississippi River.

Interest in the Minnesota River as an important natural resource resurfaced in the 1960s when the State of Minnesota established Fort Snelling State Park in 1961. The Minnesota River was one of four rivers in the state designated by the Legislature as a state canoe and boating route in 1963. Subsequently, the Legislature authorized the Minnesota Valley State Trail in 1969 which extends from Fort Snelling to LeSueur. During this period, local units of government also began preserving the natural resources of the valley. For example, the Hennepin County Park Reserve District acquired the James J. Wilkie Park Reserve located near Shakopee and Savage. Likewise, Bloomington acquired portions of the valley for park purposes. Some of these lands eventually became part of the Refuge.

The 1970s brought increased environmentalism and significant change to the Valley. In reaction to the proposed expansion of the Burnsville landfill, which is located in the

floodplain, a non-profit citizen's organization known as the Burnsville Environmental Council proposed the creation of a national wildlife refuge and recreation area. With the support of the Bloomington Natural Resource Commission in 1973, an ad hoc Lower Minnesota Valley Citizen's Committee was established to promote the refuge and recreation area concept. Their dreams were realized in 1976 with the passage of the Minnesota Valley National Wildlife Refuge Act (Public Law 94-466).

Social and Economic Context

The seven-county Twin Cities Metropolitan Area is a vibrant community that serves as a major hub for agriculture, transportation, industry, finance, trade, and technology. Several renowned universities, including the University of Minnesota, make significant contributions to education, science, and medical research. The well-known Guthrie Theater and the world-class Minneapolis Institute of Art reflect area residents' interest in the arts. The world famous Mall of America in Bloomington is located directly upstream from Refuge lands. Year-round outdoor recreation is very important to the citizens of the area and many enjoy activities such as boating, fishing, swimming, skating, skiing, and snowmobiling. These residents are concerned about the quality of their environment as reflected by the presence of more than 30 environmental education and interpretive centers. Over the past decade, this vibrant economy has seen unprecedented growth which has lead to significant suburban sprawl. New or modernized infrastructure that support this growth includes roads, bridges, utilities, and airports. To a large degree, all of this places added developmental pressure on any remaining open space in this portion of Minnesota.

Natural Resources

Plant Communities

The Refuge and the District are located within the transition zone between the Eastern Broadleaf Forest and the Prairie Parkland ecoregions as defined by Bailey, et al. Plant communities within this transition contain a mixture of hardwood forest, oak savanna, and mesic prairie. The many lakes, wetlands, streams, and springs of these ecoregions exhibit diverse emergent and submergent aquatic vegetation. The specific community types and their quality are dependent upon a number of factors including climate, soils, historical vegetation, previous disturbance, and habitat restoration and management activities.

On a refined scale, Refuge and District vegetation have been mapped using the Minnesota Land Cover Classification System as developed by the MnDNR in partnership with The Nature Conservancy. This five-tier system integrates cultural features, non-native vegetation, natural and semi-natural vegetation into a comprehensive land cover classification system. To the degree possible, we will use the terminology and definitions of this system to describe site-specific plant communities.

Wetlands

Refuge units contain a variety of wetlands ranging from shallow wet meadows and calcareous fens to permanently flooded mixed emergent marshes. The river units are dominated by the latter where water is continuously present. Nearly all of these wetlands are spring fed and most of these large riverine basins are surrounded by mature cottonwood, willow, silver maple, and box elder. Water control structures have been installed on several basins and water levels are managed to control rough fish and greatly improve the productivity of the aquatic communities. Many species of waterfowl, marsh, and waterbirds are attracted to the resulting hemi marsh conditions in search of food and cover. Purple loosestrife, although not found universally, does occur in some of these wetlands and is a major concern.

Calcareous fens are also present on a few units, most notably on the Savage Fen. These wetlands are typically located at the toe of the Minnesota River bluff and occur on shallow or deep peaty soils in areas of calcareous groundwater discharge. The high concentrations of dissolved salts plus discharge water low in oxygen promotes the occurrence of rare plant species in the community. The long-term viability of fens is very much dependent upon land uses. Any significant reduction in the amount of upstream permeable soils and related groundwater discharge can threaten this rare plant community.

Round Lake is a 120-acre permanent wetland surrounded by cottonwood, maple, and box elder. The shallow lake is an open body of water and aquatic emergents are limited to a narrow fringe of cattail, slender bulrush, and water lily. Two storm water sewers enter Round Lake and have the potential to impact its water quality. A previously installed water control structure provides water level management capabilities. Due to a number of factors, including the potential exposure of heavy metals, water levels for Round Lake have been maintained at a constant level over the past 15 years.

The Waterfowl Production Areas and easements located within the District are characterized by temporary, seasonally flooded, and semipermanent emergent and cattail marshes. These wetlands overlay hydric soils and most have been restored on land formerly used for agriculture. The productivity of these wetlands is generally high due to periodic drought and recharging. The value of these areas to birds, mammals, reptiles, amphibians, and invertebrates increases as the diversity of wetland types increases within any geographic area.

Forests

Floodplain forests historically dominated much of the floodplain along the Minnesota River and its tributaries. Today, this plant community remains on several of the Refuge river units and a few Waterfowl Production Areas. Typical tree species found in these seasonally flooded areas include silver maple, cottonwood, American elm, green ash, boxelder, and occasionally, bur oak. The understory of these forests is generally open and in places the groundcover consists of wood nettle. In the past several years, former Refuge croplands that were historical floodplain forest have been replanted with species typical of this community.

Oak forests dominated by northern pin and white oaks are the most common upland forest community on the Refuge. These stands occur on nutrient-poor hillsides and well-drained sandy soils along the Minnesota River Valley. The shrub layer in these communities is frequently dense where American hazel, dogwood, and blackberries are commonly found. The control of European buckthorn, a prolific exotic is some of these plant communities, is a very significant challenge.

Photograph by Scott Sharkey

Many of the oak forests described above were historic oak savanna prior to European settlement and the subsequent control of fires. Natural regeneration of this plant community is rare due to the inability of oak to reproduce under forest canopies. Since 1994, several oak savanna restoration sites have been identified on the Refuge. Restoration has been initiated on these sites through a rigorous combination of mechanical treatment and prescribed burning. Initial results are encouraging as evidenced by the return of a diverse understory of native grasses and forbs.

Grasslands

Remnant native prairie is some of the most diverse and important plant communities that exist in the Midwest. These rare and unique grasslands on Refuge units include both mesic and dry prairie and they are frequently interspersed with woodland areas, especially those forested sites protected from periodic fires. Mesic prairie is dominated by tall grasses including big bluestem and Indiangrass. Medium-height grasses such as little bluestem and side oats grama dominate dry prairies. Both mesic and dry prairies found on the Refuge contain shrubs such as leadplant and wild rose. Pasque flower and purple prairie clover are commonly found in both plant communities.

Native grassland restoration has occurred on upland sites of Refuge units, Waterfowl Production Areas, easements, and associated private lands for many years. Former croplands are typically planted to native grass mixtures consisting of big bluestem, little bluestem, switch grass, side oats grama, and Canada wild rye. A mixture of forbs is also planted to enhance the biological diversity of many of these sites.

Fish and Wildlife Communities

The habitats described above support an array of wildlife species that are common to east central Minnesota. A rich diversity of birds, mammals, fish, reptiles, and amphibians inhabit lands administered by Minnesota Valley National Wildlife Refuge.

Birds

The Refuge and its associated District attracts over 260 species each year to its diverse habitats. Of these, over 120 are known to nest in the area. Common waterfowl of the area include Canada Goose, Mallard, Wood Duck, Green-winged Teal, Gadwall, and American Wigeon. Waterfowl concentrate on Refuge and District wetlands during spring and fall.

Marsh and waterbirds frequently observed in the valley and surrounding areas include Great Egrets, Double-crested Cormorants, Great Blue Heron, Green Heron, and Black-crowned Night- Heron. A heron rookery consisting of an estimated 750 nest sites exists on the Wilkie Unit. The most prolific species of this colony are Great Blue Herons and Great Egrets. Exposed mud flats on Refuge riverbanks and Waterfowl Production Area wetlands attract shorebirds including Greater and Lesser Yellowlegs and Spotted Sandpiper. Both Common Snipe and American Woodcock are commonly found on these lands as well.

Neo-tropical migrants attracted to forested habitats include nighthawk, wood thrush, vireo, and several warbler species. Year-round residents include Downy, Hairy, Pileated and Red-bellied Woodpecker; Wild Turkey; and Ring-necked Pheasant. Birds of prey inhabiting Refuge lands include Red-tailed Hawk, American Kestrel, Sharp-shinned Hawk and Cooper's Hawk.

Mammals

At least 50 mammals occur on Refuge lands as year-round residents and the most visible of these, of course, is the whitetail deer. During the 1970s and 1980s, deer populations exceeding 100 per square mile within the urban portions of the Refuge significantly damaged the area's vegetation. Populations have since been decreased to a more sustainable level of 20-25 deer per mile using a combination of controlled hunts and sharpshooting. The removal of an average of 45 deer each year on Refuge lands is necessary to keep the populations at this level.

Mammals attracted to aquatic habitats include mink, muskrat, racoon and beaver. As with most refuges, relatively high populations of beaver tend to complicate water management activities. River otter, once nearly eliminated in this area, are now occasionally seen utilizing Refuge wetlands and river banks.

Small mammals typical of this area include short-tail shrew, white-footed mouse, thirteen-lined ground squirrel, and plains pocket gopher. Eastern chipmunks plus eastern gray, eastern fox, and red squirrels are commonly founded in forested habitats. Both big and little brown bats use the Refuge and its associated lands. Red fox are the most common carnivores of the area followed by coyote and gray fox.

Fish

The Minnesota River is inhabited by an array of fish including game species such as northern pike, large mouth bass, walleye, bluegill, and crappie. Other species include shovel nose sturgeon, catfish, and red horse. Like most other fresh water systems in the United States, high populations of carp inhabit the Minnesota River. Due to regular spring flooding, many of the Refuge wetlands contain a diversity of fish that originate in the river. For some species, these wetlands offer spawning and nursery habitat.

Reptiles and Amphibians

Thirty species of reptiles and amphibians have been reported on the Refuge but little is known about their populations or their limiting factors. Many of these, such as the snapping and painted turtles, are associated with marsh and open waters while others, such as the common garter snake and the hognosed snake, occur in oak savanna and prairie. The chorus of spring peepers is common throughout the Minnesota River Valley during spring.

Cultural Resources

Several hundred archaeological and cultural sites exist in the Lower Minnesota River Valley and many are located on Refuge lands. These sites include prehistoric burial mounds and village sites, early 19th century trading posts and ferry crossings, and early 20th century bridges and farmsteads. As an important part of this CCP process, the Service contracted for a cultural resources study of Minnesota Valley National Wildlife Refuge and associated areas. The product of this study is a report entitled "*Cultural Resources Management Plan for Cultural Resources within the Minnesota Valley National Wildlife Refuge*" prepared by Anthony Godfrey, Ph.D. of U.S. West Research, Inc. in Salt Lake City, Utah. This plan builds upon the previous work that has been accomplished in this area plus offers significant documentation and guidance concerning the management of these resources.

In light of the large number of archaeological and cultural sites on or near Refuge lands, considerable care will be exercised to avoid any potential impact. If needed, site-specific archaeological surveys will be completed before any significance ground disturbance occurs. Likewise, any effort to upgrade or stabilize historical structures will done in such as fashion to maintain their historical character.

Migratory Bird Conservation Initiatives

Several migratory bird conservation plans have recently been published that can be used to help guide management decisions for the Refuge and District. Over the last decade, bird conservation planning efforts have evolved from a largely local, site-based focus to a more regional, landscape-oriented perspective. Several trans-national migratory bird conservation initiatives have emerged to help guide the planning and implementation process. The regional plans relevant to the Minnesota Valley Refuge and District are:

(1) The Upper Mississippi River/Great Lakes Joint Venture Implementation Plan of the North American Waterfowl Management Plan;
(2) The Partners in Flight Boreal Hardwood Transition [land] Bird Conservation Plan;
(3) The Upper Mississippi Valley/Great Lakes Regional Shorebird Conservation Plan; and
(4) The Upper Mississippi Valley/Great Lakes Regional Waterbird Conservation Plan.

All four conservation plans will be integrated under the umbrella of the North American Bird Conservation Initiative in the NABCI Prairie Potholes, Eastern Tallgrass and Prairie Hardwood Transition Bird Conservation Regions (BCR 11, 22 and 23).

Each of the bird conservation initiatives has a process for designating priority species, modeled to a large extent on the Partners in Flight method of calculating scores based on independent assessments of global relative abundance, breeding and wintering distribution, vulnerability to threats, area importance, and population trend. These scores are often used by agencies in developing lists of priority bird species. The Service based its 2001 list of nongame Birds of Conservation Concern primarily on the Partners in Flight, shorebird, and waterbird status assessment scores.

Fish, Wildlife and Plant Species of Management Concern

Table 1 summarizes information on the status and current habitat use of important fish, wildlife, and plant species found on lands administered by the Refuge. Individual species, or species groups, were chosen because they are listed as Regional Resource Conservation Priorities or State-listed threatened or endangered species. Other species are listed due to their importance for economic or recreational reasons or for their status as a nuisance or invasive species.

Table 1: Wildlife and Plant Species of Concern to the Minnesota Valley NWR and Wetland Management District

Species (* = managing habitat for these species)	Refuge Status	Monitored on Refuge by Staff or by MnDNR?	Regional/ State Status R#: Conservation Priority R3 SMC: Species of Concern R3 E: Federal Endangered T: Federal Threatened SE: State Endangered ST: State Threatened SSC: State Species of Concern	Potential Benefit by Habitat Habitat used for Production (P) or Migration (M)				
				Wetlands	Floodplain Forest	Upland Forest	Oak Savanna	Grasslands
White-tailed Deer*	Recreation/economic Common/abundant	Yes			P	P		
Eastern Spotted Skunk	Uncommon	Yes	ST		P			P
Prairie Vole	Rare	No	SSC					P
Least Weasel	Rare	No	SSC	P	P			P
Northern myotis	Rare	No	SSC		P			P
Plains Pocket Mouse	Uncommon	No	SSC				P	P
Eastern pipistrelle	Rare	No	SSC		P			P
Common Loon	Occasional	Yes	SMC	M				
Horned Grebe	Rare	Yes	ST	M				
American White Pelican*	Common seasonally	Yes	SSC	M				
Double-crested Cormorant	Common/ increasing	Yes	R3 (nuisance)	M	M,P			
Franklin's Gull	Rare	Yes	SSC	M				M
Black Tern*	Uncommon	Yes	R3	M,P				
Common Tern	Accidental	Yes	R3, ST	M				
Forester's Tern	Uncommon	Yes	R3, SSC	M,P				
Great Blue Heron*	Common/ increasing	Yes		M,P	P			
Great Egret*	Common/ increasing	Yes		M,P	P			

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				Wetlands	Floodplain Forest	Upland Forest	Oak Savanna	Grasslands
Black-Crowned Night Heron*	Uncommon	Yes	R3	M,P	P			
American Bittern	Occasional	Yes	R3	M,P				
Least Bittern	Uncommon	Yes	R3	M,P				
Common Moorhen	Rare	Yes	R3, SSC	M,P				
King Rail	Accidental	No	R3	M				
Trumpeter Swan*	Uncommon	Yes	R3, ST	M,P				
Snow Goose	Occasional	Yes	R3 (nuisance)	M,P				
Canada Goose (Migrants)	Recreation/economic Common	Yes	R3	M,P				
Canada Goose (Residents)*	Recreation/economic Common/nuisance	Yes	R3 (nuisance)	M,P				
Blue-winged Teal*	Recreation/economic Common	Yes	R3	M,P				
Canvasback*	Recreation/economic Uncommon seasonally	Yes	R3	M,P				
Lesser Scaup*	Recreation/economic Common seasonally	Yes	SMC	M				
Mallard*	Recreation/economic Common	Yes	R3	M,P				
Northern Pintail*	Recreation/economic Common seasonally	Yes	SMC	M				
Wood Duck*	Recreation/economic Common	Yes	R3	M,P	P	P	P	

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				Wetlands	Floodplain Forest	Upland Forest	Oak Savanna	Grasslands
American Woodcock	Recreation/economic Uncommon	No	R3	M	M		M,P	M,P
Marbled Godwit	Accidental	No	R3, SSC					M,P
Hudsonian Godwit	Accidental	No	R3					M
Upland Sandpiper*	Accidental	No	SMC					M,P
Buff-breasted Sandpiper	Accidental	No	R3					M
Short-billed Dowitcher	Rare	No	R3	M				
Stilt Sandpiper	Occasional	No	R3	M				
Greater Yellowlegs	Uncommon	No	R3	M				
Wilson's Phalarope	Rare	No	R3, ST	M				
Bald Eagle*	Threatened/recovering	Yes	T, SSC	M	M,P			
Northern Goshawk	Rare	No	R3		M	M		
Northern Harrier*	Occasional	No	SMC					M,P
Peregrine Falcon*	Uncommon	No	ST	M				M
Red-shouldered Hawk*	Rare	No	R3, SSC		M,P	M,P		
Short-eared Owl	Rare	No	SMC, SSC	M				M,P
Long-eared Owl	Occasional	No	R3	M				M

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				Wetlands	Floodplain Forest	Upland Forest	Oak Savanna	Grasslands
Black-billed Cuckoo	Occasional	No	R3, SMC		M,P	M,P	M,P	
Whip-poor-will	Rare	No	R3		M	M	M	
Red-headed Woodpecker*	Uncommon	No	SMC		M,P	M,P	M,P	
Northern Flicker	Common	No	SMC		M,P	M,P	M,P	M
Olive-sided Flycatcher	Occasional	No	SMC	M	M	M	M	
Loggerhead Shrike*	Accidental	No	R3, ST				M,P	M,P
Bell's Vireo	Rare	No	SMC	M,P				M,P
Sedge Wren*	Uncommon	No	R3	M,P				M,P
Wood Thrush	Occasional	No	R3		M	M,P		
Louisiana Waterthrush	Accidental	No	R3, SSC	M	M,P			
Golden-winged Warbler	Rare	No	R3		M	M	M,P	
Cerulean Warbler	Rare	No	R3, SSC		M,P	M,P		
Blue-winged Warbler	Rare	No	SMC		M,P	M,P		
Connecticut Warbler	Rare	No	R3		M	M		
Canada Warbler	Occasional	No	R3		M	M		
Cape May Warbler	Occasional	No	R3		M	M		
Hooded Warbler	Very Rare	No	SSC		M,P			
Prothonotary Warbler	Occasional	No	R3	M	M,P			

Table 1: Wildlife and Plant Species of Concern to the Minnesota Valley NWR and Wetland Management District

Species (* = managing habitat for these species)	Refuge Status	Monitored on Refuge by Staff or by MnDNR?	Regional/ State Status R#: Conservation Priority R3 SMC: Species of Concern R3 E: Federal Endangered T: Federal Threatened SE: State Endangered ST: State Threatened SSC: State Species of Concern	Potential Benefit by Habitat Habitat used for Production (P) or Migration (M)				
				Wetlands	Floodplain Forest	Upland Forest	Oak Savanna	Grasslands
Black-throated Blue Warbler	Rare	No	R3		M	M		
Field Sparrow	Uncommon	No	SMC				M,P	M,P
Grasshopper Sparrow*	Occasional	No	R3					M,P
Henslow's Sparrow	Accidental	No	R3, SE					M,P
Le Conte's Sparrow	Rare	No	R3				M	M
Nelson's Sharp-tailed Sparrow	Accidental	No	R3				M	M
Dickcissel*	Occasional	No	R3					M,P
Bobolink*	Uncommon	No	R3					M,P
Rusty Blackbird	Occasional	No	R3	M				M
Orchard Oriole	Rare	No	R3				M	
Western Meadowlark	Rare	No	R3				M	M,P
Eastern Meadowlark*	Uncommon	No	R3					M,P
Blandings Turtle	Rare	No	ST	P	P		P	
Northern Cricket Frog*	Rare	Yes	SE	P				
Smooth Softshell	Common	No	SSC	P				
Snapping Turtle	Common	No	SSC	P	P			
Wood Turtle*	Rare or Absent	No	ST		P			
Five-lined Skink	Rare	No	SSC		P	P	P	

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				Wetlands	Floodplain Forest	Upland Forest	Oak Savanna	Grasslands
Gopher (Bull) Snake	Common	No	SSC				P	P
Racer	Uncommon	No	SSC			P	P	P
Western Hognose Snake	Common	No	SSC				P	P
Brook Trout	Uncommon	No	R3					
Least Darter	Uncommon	No	SSC					
Paddlefish	Rare	No	R3, SSC					
Pugnose Shiner	Rare	No	SSC	P				
Higgins Eye Pearly Mussel	Absent (Historic)	No	E					
Arogos Skipper (Butterfly)	Rare	Yes	SSC				P	P
Leonardus Skipper	Rare	Yes	SSC				P	P
Powesheik Skipper	Rare	Yes	SSC				P	P
Regal Fritillary	Rare	Yes	SSC				P	P
Karner Blue	Rare or Absent	No	T					
Dwarf Trout Lily	Rare	No	E, SE		P	P		
Prairie Bush Clover	Rare or Absent	No	T, ST					P